***We can achieve excellent performance* from a Silent DG set, if proper care is taken during its *installation.* (The following suggestions shall help you to achieve *optimum performance from the D.G. Set.)***

For Assistance

Please contact our customer care at C-266-267, Mayapuri Industrial Area, Phase-II, New Delhi-110 064

Mobile No. 9871590738, 9871590745
Phone No. 011-28114072 (D), 28111510, 28113231, Fax No. 28113149
e-mail**:** jaksonco@jakpower.com, jakson.service@jakpower.com

In case you are not satisfied, kindly register your complaint to Mr. Gopi Nathan
**Mob. : 9910448420**

Note:

1. Please always sign the report made by our Service Engineer.
2. Warranty is applicable for two years for engine & alternator only subject to use of Kirloskar K-Oil Premium, Kirloskar genuine filters, K cool super plus and services sourced through KOEL authorized Service Dealer.

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## SELECTION OF SITE

- Proper space should be there for placement and opening of doors of the Silent DG set.
- There should be atleast 1.5 meter free space around the DG set for proper operation and maintenance.
- There should be cross ventilation of air to ensure proper cooling of DG set. Exhaust gases and hot air discharge should not re-circulate inside the acoustic enclosure (canopy).
- If Genset is to be installed in the room, please ensure proper cross ventilation and surrounding space.
- There should be no restriction for fresh air suction and hot air discharge. If 2 nos. DG sets are installed at the site, ensure that hot air outlet of the one DG set does not become the fresh air intake of the 2nd DG set.
- If Genset is to be installed in the basement, please ensure ventilation with respect to Air requirement and clear space for every maintenance.
- Distance between two SDG set should be minimum 3 meters.
- A low height shelter for the Silent DG Set should be avoided. It should not obstruct the hot air outlet.
- It is preferable to install the DG set in an open area. No shade (roof) is required over it. However, if the AMF Panel is outside the Acoustic Enclosure, then a shelter is recommended for the AMF Panel.
- For Roof Top Installation, ensure that the civil structure is capable to bear the static and dynamic load of DG set. The load of the Silent DG set should be borne by Columns and Beams of the building.
- Proper space should be there for Earthing.
- If there are no space constraints, the DG set should be placed near the distribution panel.
- The DG set should be located away from polluted surroundings such as corrosive fumes, cement dust, fibres, cotton and toxic chemicals to avoid overheating of the D.G. Set.
- There should be sufficient space around the Genset to avoid resonance and echo effect which contributes to abnormal sound from Genset.
- The space should be open without any obstacles.

# FOUNDATION DETAILS AND GUIDELINES

A. Ground base Foundation (RCC/PCC)

- The foundation should be water leveled and at least 3"/4" above the ground level to maintain cleanliness and avoid flooding.
- The length and width of the foundation should be at least 600mm to 800 mm more than that of the DG set size i.e. 300mm on each side. Check the foundation level diagonally as well as across the length and width.
- Please refer to the foundation drawing attached herewith (page-3).
- A rigid foundation ensures the least vibration. Sand Filling should be there around the foundation. 18mm rubber matting must be used over the foundation to minimize the vibration effect and noise leakage.
- Ensure that the foundation to support 1.5times of the total wet weight of the single generator and 2 times of the total weight for the multiple generators.
- Please refer to the dimension of DG set for deciding the foundation length, width and depth.

Note: Please ensure that the foundation should not be made over any basement, water tank or Sewer Line.

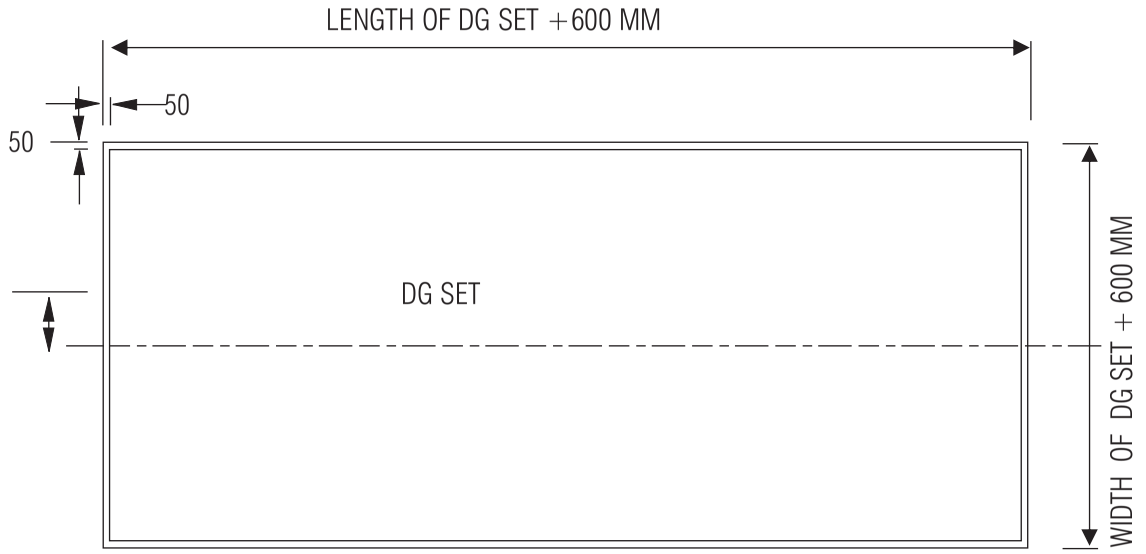
B. Roof top Installation

- A rooftop installation requires proper planning and the structural design considerations for dynamic loading.
- The weight of Silent DG set should be on Column and Beam through proper foundation.
- The RCC foundation should be on the Beam or supported on two Beams.
- ISMC Channel or MS "I" Section may also be used to cater the load of the DG set with the canopy. Load of ISMC Channel or MS "I" Section should be on the column of the building.
- M.S. Sheet is to be provided at the bottom of the base frame of the Silent DG set for roof top installation.

JAKSON & CO.

NOT TO SCALE

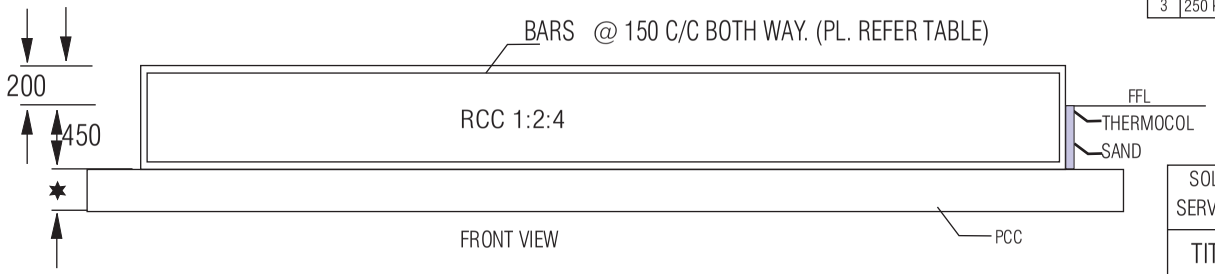
IF IN DOUBT ASK




TOP VIEW

TABLE FOR BAR' S SIZE

| S.NO | RATING OF SLENT DG SET | SIZE OF BAR |
|---|---|---|
| 1 | UP TO 82.5 KVA | 10MM DIA |
| 2 | 100 KVA TO 200 KVA | 12MM DIA |
| 3 | 250 KVA TO 600KVA | 16MM DIA |




FRONT VIEW

✱DIMENSION MARKED AS (✱) TO BE DECIDED BY STRUCTURAL CONSULTANT/ CLIENT.

*THIS IS ONLY A REFERENCE DRAWING. KINDLY CONSULT YOUR CIVIL ENGR / CONSULTANT FOR MAKING FOUNDATION

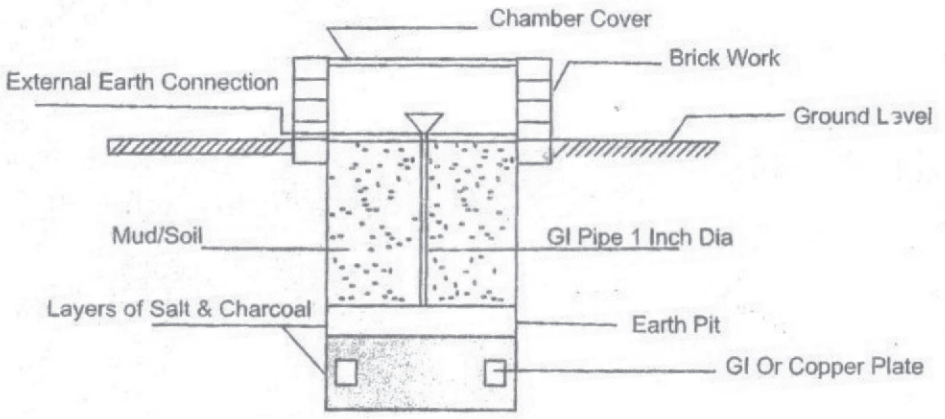
| | | | |
|---|---|---|---|
| SOLD& SERVICED | JAKSON & CO.<br>C-266,267,IND, AREA,PHASE-2,MAYAPURI, -NEW DELHI - 64 | | |
| TITLE | FOUNDATION DRAWING OF SOUND PROOF GEN SET | | |
| PART NAME | FOUNDATION DRAWING | | |
| DRAWN BY | | DRG. NO. | RF-7-06 |
| CHECKED BY | | DATE | 7/02/06 |
| APPROVED BY | | KIRLOSKAR ENGINE | |

# EARTHING SYSTEM

- An Earthing system is required for the protection of equipment and human being, as per Indian electricity Rules 1956.
- Separate earth should be used for Genset body and neutral earthing.
- 4 Nos. earthing pits are required for 3 phase DG set, 2 each for neutral & body.
- 4 Nos. earthing pits are required for single phase DG set, 2 each for neutral & body.
- The min. distance between 2 earthing pits should be 2.0 meters.
- An earth pit cover should be provided.
- A watering pipe of 25mm with a funnel should be provided for each pit, wherever depth of the earthing pit is not at water level.
- Earthing system should be checked with meagre and resistance between 2 earth pits should be less then 1Ω
- The earthing plate/pipe and strip size should be selected as per the rating of the DG set.

| SDG Set rating | Recommended Earth Strip/Cable |
|---|---|
| 5-82.5 KVA | 8SWG-Copper |
| 100-250KVA | 25X3mm Copper/25x6mm GI |
| 320-750KVA | 50X6mm Copper/50x6mm GI 2 runs |

**TYPICAL EARTH PIT / STATION ARRANGEMENT**



# Exhaust Piping

The exhaust system must be designed to keep the resistance to hot gases (back pressure) as low as possible and load of the extended exhaust pipe / silencer should not be on the engine manifold

The following may please be noted.
1. There should not be any load or stress on the expansion bellow.
2. There should be proper support for the exhaust pipe.
3. Exhaust Pipes should be extended through proper flanges only.
4. Short bend should be avoided.
5. Always use proper size MS pipe ( G.I. Pipe and bend should not be used in exhaust piping)
6. At the time of Genset Installation , Please ensure proper alignment of exhaust silencer with respect to expansion bellow

Exhaust pipe load should not come on Expansion bellow and it should not touch the roof body.

As per statutory regulations, exhaust pipe has to be extended above the surrounding stack as below.

$H = h + 0.2 \times \sqrt{kva}$

Where H = Minimum height of exhaust stack, h= height of building

**Exhaust Pipe Details**

| Engine Model (Air Cooled) | Minimum exhaust pipe OD (mm) |
|---|---|
| EA10 G1 /EA16 G1 | 50 |
| HA294 G1/HA394TCI G1/HA494TCI G1 | 63 |
| HA694TCI G1 | 76 |

| Engine Model (Water Cooled) | Minimum exhaust pipe OD (mm) |
|---|---|
| 2R1040 G1 | 63 |
| 3R1040T G1/3R1040TA G1 | 76 |
| 4R810TA G1/4R1040TA G1 | 75 |
| 4K1080TA G2 /6K1080TA G2 | 101 |
| 6SL-Series | 138 |
| DV-Series | 150 |

Note-
1. If the extension of exhaust pipe is more than 5 meters above Genset, increase pipe diameter by 13mm for every 3 meters.
2. If no.of bends are more than 4, increase the diameter of exhaust pipe and bend by 13mm for addition of each bend.
3. Joining of Exhaust pipe for the both bank is not recommended. In case of necessity common pipe diameter should be at least 10% higher and refer proper procedure (Use of NRV valve and angle between chimni and pipe should be maintained) before joining two exhaust pipe.
4. Both the Exhaust pipe should not be connected opposite to each other. Angle between pipe should be $30^{o}$ to $45^{o}$

## FUEL PIPING

- A supply and return fuel pipe is required in each DG set .
- SDGs upto 625 KVA are provided with fuel tanks inside the acoustic enclosure.
- Outside fuel tank will be provided as per requirement.
- For fuel tank inside the acoustic enclosure, fuel piping is done by the manufacturer/supplier.
- However, for Fuel Tank outside the enclosure, fuel piping is to be done by the customer.
- Size of the fuel piping should be 12mm upto 250 KVA DG set.
- B/C Class M.S. pipe (19 mm - 25mm I.D.) is recommended For fuel piping above 250 KVA DG sets.
- MS pipe should be used with proper welded joints.
- Stop valve and flange should be used in supply line to engine near fuel tank (for Fuel Tank mounted outside).

***PRECAUTIONS TO BE TAKEN FOR FUEL PIPING AND FUEL SYSTEM.***

- Never use GI pipes in fuel piping of DG set.
- Joints should be welded and never threaded.
- Pipe should be above ground level with proper MS support.
- All joints should be tested for any seepage or leakage.
- For 320 KVA and above DG sets, Fuel Tank height should be such that lowest level of Fuel Tank is above Diesel pre-filter height.

## CABLING

- It has been our experience that most electrical failures are caused by overheating due to loose thimbling or undersize cables.
- Please use cable of correct size to carry full load current and thimble of correct size for cable termination.
- At no time, loose wires should be tightened on to terminal/busbar with bolts.
- Crimping should be done with proper crimping tool.
- Ensure tight crimping/terminations to avoid overheating and burning of the cable and terminals.
- Ensure proper bending radius is given to the cable to avoid excessive tension on cable termination.
- Ensure that the weight of cables does not rest on alternator terminations. Proper support to be provided from the ground separately through cable tray.

**For 3 Phase**

| KVA | 15 | 20/30 | 35 | 45/50 | 62.5/70 | 82.5 | 100 | 125 |
|---|---|---|---|---|---|---|---|---|
| Al. Cable Size 3.5 core sq.mm | 16 | 25 | 25 | 35 | 70 | 95 | 95 | 150 |
| Copper cable size 3.5 core sq.mm. | 6.0 mm2 | 10 mm2 | 16 mm2 | 25 mm2 | 35 mm2 | 50 mm2 | 50 mm2 | 70 mm2 |
| KVA | 140 | 160 | 180/200 | 250 | 320 | 400 | 500 | 600/625 |
| Al. Cable Size 3.5 core sq.mm | 185 | 240 | 240 | 2X185 | 2x300 | 2X300 or 3x240 | 4x240 | 4X300 or 5x240 |
| Copper cable size 3.5 core/ sq.mm | 70 mm2 | 95 mm2 | 120 mm2 | 150 mm2 | 240 mm2 | 300 mm2 | 2X185 mm2 | 400 mm2 |

**For 1 Phase**

| KVA | 15 | 20 | 30 - 35 | 40 | 50 | 62.5 | 70 |
|---|---|---|---|---|---|---|---|
| Al. Cable Size 2 core/sq.mm | 35 | 50 | 70 | 120 | 120 or 2x70 | 150 or 2x70 | 150 |

| KVA | 15 | 20 | 30-35 | 40 | 50 | 62.5 | 70 |
|---|---|---|---|---|---|---|---|
| Copper Cable Size 2 core/sq.mm | 25 | 35 | 50 | 95 | 95 | 120 or 70x2 | 120 or 70x2 |

Note:- a. Correct size cable glands should always be used for holding the cable.
b. Control wiring should always be done with 2.5 sq.mm copper cable.
c. From 320 KVA to 625 KVA bus bar terminal box will be provided by customer

# BATTERY CHARGING PROCEDURE

**a. Battery charging procedure**

- Specific gravity of acid inside the battery should be 1.23 to 1.28 kg/ltr.

**Note:**

- If dry battery is supplied along with the DG set then initial charging of the battery is required.
- If battery is kept ideal for 3 month, then battery should be charged.

**b. Method to use battery**

- If DG set is not in use for a long time then ensure that at positive terminal battery lead is not connected. It should be connected at the time of the commissioning of the DG set.
- Charged battery may be used for commissioning of DG set within 15-20 days, else re-charging of charged battery is required.
- Always connect the battery with the proper battery charger. The battery should be connected to the battery charger, which is connected with 230V AC supply.
- The Battery charger is provided with an AMF Panel (Auto Mains Failure Panel) under the standard scope of supply. 230V AC supply is essential for battery charger operation.

Note: Battery charger is not supplied with a std. manual Panel. So, it is suggested that the DG set must run once a day for 15-20 minutes so that battery is charged by engine dynamo/charging alternator. Battery should not be kept ideal for 6 months.

**c. Precaution to be taken during handling of battery**

- Do not charge the battery at a wet a place.
- Flame, Candle and matchbox should not be used near charged battery.
- Use hand gloves while handling the charged battery.
- Electrolyte level should be medium.
- Always switch off the charger first before disconnecting the battery from the DG set.
- Never put tools etc. on the battery.
- Remove battery terminal ( Positive and Negative ) during any welding work on genset.

# SUMP CAPACITY (LITRES)

## AIR COOLED

| Engine Model | EA10 G1 | EA16 G1 | HA294 G1 | HA394TCI G1 | HA494 TCI G1 | HA694TCI G1 |
|---|---|---|---|---|---|---|
| Lts. | 3.5 | 6.5 | 5 | 8 | 8.3 | 11 |

## WATER COOLED

| Engine Model | 2R1040 G1 | 3R1040T G1 | 3R1040TA G1 | 4R810TA G1 | 4K1080TA G2 |
|---|---|---|---|---|---|
| Lts. | 5.5 | 8 | 8 | 10 | 14 |

| Engine Model | 6K1080TA G2 | 6SL1500TA G2 | 6SL1500TA G3 |
|---|---|---|---|
| Lts. | 18 | 27 | 27 |

| Engine Model | DV8TA G1 | DV8TA G2 | DV10TA G1 | DV12TA G1 | DV12TA G2 |
|---|---|---|---|---|---|
| Lts. | 41 | 41 | 45 | 50 | 50 |

Note- Recommended K-Oil Premium / Filters Change Interval

- First Service and Oil change within 50 hours or 30days from date of commissioning whichever is earlier( G1 Check).
- G2 Check within 500 hours or 7 months from date of commissioning whichever is earlier
- G3 Check within 1000 hours or 13 months from date of commissioning whichever is earlier
- G4 Check within 1500 hours or 19 months from date of commissioning whichever is earlier
- After first service Oil change period is 500 hours or 6 months whichever is earlier.
- If SDG Set kept ideal ( not in operation) for 6 months or more without preservation than revalidation must be carried out and customer has to bear revalidation cost.

## CHECK UP BEFORE STARTING THE DG SET

| S. No. | Description | Status |
|---|---|---|
| 1. | Air cleaner mounting | Fitted/Not fitted |
| 2. | Air cleaner cleanliness | Clean/dirty/replaced (Dry or oil type) |
| 3. | Air cleaner clamps Hoses | Cracked/normal/ not clamped / tightened |
| 4. | Grade & specs of oil used | 15W40 as per koel manufacture's recommendation |
| 5. | Lub oil level & positioning of oil filter | OK/Not OK |
| 6. | Check lub oil safety | OK/Not OK |
| 7. | All Nuts & Bolts | Proper Tightened |
| 8. | Battery condition | Charged/Discharged |
| 9. | Battery Terminal/Leans | Proper/damaged/ replaced |
| 10. | Electrolyte level | High/Medium/Low |
| 11. | Fuel Filter | Proper/to be replaced |
| 12. | V Belt for charging alternator | Proper Tightened/not Proper |
| 13. | V Belt tension | Proper/adjusted |
| 14. | Coolant level in the Radiator | High\|Medium\|Low\|filled |
| 15. | Check coolant temp. safety | OK/not OK |
| 16. | Wiring (Engine/Panel) | OK/not OK |
| 17. | Check all wires tightening | OK/not OK |
| 18. | Alternator back cover | Fitted/removed |
| 19. | Cable termination | Proper/loose/Tightened |
| 20. | Canopy door alignment | proper/adjusted/not proper |
| 21. | Canopy door hinge operation | OK/not OK/Adjusted |

# Routine Maintenance of SDG Set.

| Every 10th Hour/ Daily | In Running Hours | | | | | | | Job |
|---|---|---|---|---|---|---|---|---|
| | 1st 50 | 250 | 500 | 750 | 1000 | 2500 | 5000 | |
| ✸ | | | | | | | | Engine oil level. |
| ✸ | | | | | | | | Coolant level in radiator and compensatory tank. |
| ✸ | | | | | | | | Restriction indicator of dry type air cleaner / radiator. |
| ✸ | | | | | | | | Rubber hose & clips of dry type air cleaner / radiator. |
| | ● | | ● | | ● | ● | ● | Engine oil (Every 500 Hrs.). |
| | ● | | ● | | ● | ● | ● | Lube oil filter cartridge (Every 500 Hrs.) |
| | ✸ | | | | | | | Battery and lead connections (Every 50 Hrs.). |
| | | ✸ | ✸ | ✸ | ✸ | | | 'V' Belt condition and tension (adjust / replace if required). |
| | | ▲ | ▲ | ▲ | ▲ | | | Radiator fins (depends on site condition) externally. |
| | | | | | | | ▲ | Radiator tubes internally. |
| | | | ● | ● | ● | ● | ● | Replace fuel filter cartridge after every 500 Hrs. |
| | | | | | | ✸ | ✸ | Injector. |
| | | ▲ | ▲ | ▲ | ▲ | ▲ | ▲ | Fuel strainer (Button filter). |
| | | | | | | | ✸ | Thermostat element (change if necessary). |
| | | | | | | ✸ | ✸ | Valve clearance (adjust if necessary). |
| | | | | | | ✸ | ✸ | Starter / Alternator. |
| | | | | | | ✸ | ✸ | Fasteners |
| | | | | | | | ✸ | Exhaust Silencer. |

✸ Check / Adjust ● Change ▲ Clean

## PRE-COMMISSIONING CHECK

Whenever you want to call a Service Engineer for commissioning, kindly ensure that --

- Installation work has been completed (i.e. foundation, earthing, exhaust pipe job has been completed with proper supports, if extended beyond the canopy)
- Fuel pipe line job is completed, if Fuel Tank is outside the canopy.
- If DG set installed inside a room, a duct to be provide for fresh air & hot air exit should be 1.5 times higher then the canopy inlet & outlet.
- Power cable laying, fitting and connection jobs are completed with proper glanding.
- If panel is out side canopy, Power Cable Control cable laying, fitting & connection jobs have been completed.
- Most important - Battery is charged.
- If the DG set is with AMF Panel, then 230 V AC mains or 415 V AC mains (R,Y,B,N) supply is provided at the AMF Panel to check its operation and for Battery Charger.
- Diesel is available in the Diesel Tank.
- Engine is duly filled with Lube Oil upto "H" mark
- Coolant level is up to 'H' mark
- Load is available.

Note: It is mandatory to get your Diesel Generating Sets commissioned on load and kindly do sign the commissioning report made by our Service Engineer.

## ROUTINE CHECK POINTS

- Check Fuel Level
- Drain water from fuel Tank (Especially during winter Season.)
- Check Coolant level in the Radiator
- Check for any leakage
- Check for any loose connections
- Check Battery condition
- Check Lube oil level and quality (lube oil should not be very thick with visible carbon and metal particles).

## DO`s

- Check fuel /coolant/lube oil level
- Check for any leakage
- Check electrolyte level in Battery, It should be between 1.23-1.28 kg/ltr
- Check Fan belt tension
- Check battery charger
- Drain the water from fuel tank,weekly during winters
- Check all nuts, Bolts, Engine/Alternator foundation bolts tightness at the time of commissioning then monthly
- Check for any loose connections at the time of commissioning then monthly
- Use K-cool super plus, Lube K-oil Premium and spares as per KOEL specification and purchase from authorized KOEL service dealer
- Refer Engine maintenance manual for routine and daily maintenance check.
- Study 'user manual' in detail before usage.
- Keep good ventilation which is essential to keep the air,cool and clean.
- Use appropriate tools and equipments which are required to carry ot any service.
- Ensure all nuts, screw, pipe, connections and covers are properly tightened
- Ensure that sufficient diesel fuel ,oil in the tank & lube oil in the engine( for specification, grade of oil & coolant refer to O & M)
- Check the battery codition and connections
- Check earthing of the generator set
- Apply load on the genset gradually
- Carry out maintenance repairs & overhauling of the genset as per recommended schedules in the user manual
- Call on the authorised service dealer for servicing & maintenance work.
- Please refer maintenace maual before doing any maintenance work.
- Cable entry hole, if not in use, should be properly closed.

## DON`Ts

- Do not Repair /Service any part when set is running.
- Never operate the genset with any parts or ducting removed.
- If any fault is traced, Do not attempt to start the genset unless fault is rectified.
- Do not use start push button continously for more than 5 seconds.
- Do not check lub oil, coolant level while DG set is running.
- Do not change or modify any wiring, it may cause void of warranty.
- Do not turn off the fuel supply for stopping the genset unless any emergency.
- Do not start genset on load.
- Do not allow the genset to run idle for Long periods on no load.
- Do not leave behind tools,waste cloth,loose wires etc, after repair or maintenance work is completed near the genset.
- If the DG set is with AMF panel do not tuch live wire as Main supply is available in circuit from AMF panel even if DG set is OFF.
- Do not get the DG set repaired and serviced by any unauthorized person. It may cause void of warranty.
- Do not add acid of any strength to the Battery, for topping up use distilled water only.
- Do not attempt to open the locked doors it can cause failure of door lock.

# TROUBLE SHOOTING - ENGINE

Important Note - Trouble shooting points are given just for reference. Please do contact KOEL service dealer for any check or repair.

| Description | Causes | Remedies |
|---|---|---|
| Engine does not start | No fuel in Tank | Fill Fuel in tank |
| | Air in Fuel line | Vent air from fuel line |
| | Choked fuel line | Clean and clear fuel line |
| | Dirty /clogged air cleaner | Check Vaccum indicator, if red ribbon is visible then Clean air cleaner( refer manual for cleaning) |
| | Dirty or choked fuel filter | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Faulty starter | Contact to KOEL Service Dealer |
| | Engine used after a long time | Check and Charge battery or Contact to KOEL Service dealer |
| | Battery discharged | Charge the Battery |
| | Loose or dislodged wiring | Check wiring,it should be as per drawing andTightened |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| Engine fails to start | Engine used after a long time | Contact to KOEL Service Dealer |
| | Engine seized | Contact to KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| | Faulty starter | Contact to KOEL Service Dealer |
| | Battery run down/under rating | Contact to manufacturer or Service dealer |
| | Loose or dislodged wiring | Check wiring,it should be as per drawing andTightened |
| Engine start but stops after some time | Dirty /clogged air cleaner | Check Vaccum indicator, if red ribbon is visible then Clean air cleaner( refer manual for cleaning) |
| | No fuel or Low fuel in tank | Fill Fuel in tank |
| | Poor quality of fuel | Change the fuel and use good quality fuel |
| | Air in Fuel line | Vent air from fuel line |
| | Choked fuel injector holes | Contact to KOEL Service Dealer |
| | Dirty or choked fuel filter | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Water mixed with fuel | Check the reason and sort out or Contact to manufacturer/ KOEL service dealer |
| | Engine seized | Contact to KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| Engine not taking load | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Dirty /clogged air cleaner | Check Vaccum indicator, if red ribbon is visible then Clean air cleaner( refer manual for cleaning) |
| | High exhaust back pressure | Check Exhaust pipe arrangement, it should be as per manufacturer recommendation,Contact to manufacturer |
| | Derating due to temp,altitide,humidity | Contact to manufacturer |
| | Poor quality of fuel | Change the fuel and use good quality fuel |
| | Choked fuel line | Clean and clear fuel line |



*Contd.*

| | | |
|---|---|---|
| | Choked fuel injector holes | Contact to KOEL Service Dealer |
| | Dirty/Choked fuel filter | Contact to KOEL Service Dealer |
| | Fuel level setting wrong | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Water mixed with fuel | Check the reason and sort out or Contact to manufacturer/ KOEL service dealer |
| | Radiator fins choked | Clean the radiator fins |
| | Loose V-Belt | Contact to KOEL Service Dealer |
| | No coolant or level low in radiator | Top up with K Cool super plus |
| | Wrongly adjusted valve clearance | Contact to KOEL Service Dealer |
| | Blown cylinder head gasket | Contact to KOEL Service Dealer |
| | Valve leakage | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | In correct valve & fuel timing | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | Faulty governor setting | Contact to manufacturer or KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| Engine speed does not remain constant | Choked fuel line | Clean and clear fuel line |
| | Poor quality of fuel | Change the fuel and use good quality fuel |
| | Choked fuel injector holes | Contact to KOEL Service Dealer |
| | Damage or dribbling nozzle | Contact to KOEL Service Dealer |
| | Dirt / choked fuel filter | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | Faulty governor setting | Contact to manufacturer or KOEL Service Dealer |
| | Load at the time of starting | Start generator at no load |
| Engin dos not reach governed speed | Choked fuel line | Clean and clear fuel line |
| | Dirt / choked fuel filter | Contact to KOEL Service Dealer |
| | Control lever setting wrong | Contact to KOEL Service Dealer |
| | Engine overloading | Ensure Load as per rating or manufacturer recommendation |
| Excessive smoke at no load or low load | Dirt/clogged air cleaner | Clean air cleaner |
| | Damage or dribbling nozzle | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Engine used after a long time | Contact to KOEL Service Dealer |
| | Wrongly adjusted valve clearance | Contact to KOEL Service Dealer |
| | Blown cylinder head gasket | Contact to KOEL Service Dealer |
| | Valve leakages | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | Incorrect bearing clearances | Contact to KOEL Service Dealer |
| | Damaged main & connecting rod bearings | Contact to KOEL Service Dealer |
| | Incorrect valve & fuel timing | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | Faulty governor setting | Contact to manufacturer or KOEL Service Dealer |
| | One or more cylinder not working | Contact to KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |

| | | |
|---|---|---|
| Excessive smoke at full load | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Dirt/ clogged air cleaner | Clean air cleaner |
| | Derating due to temp,altitide,humidity | Contact to manufacturer |
| | Poor quality of fuel | Change the fuel and use good quality fuel |
| | Choked fuel injector holes | Contact to KOEL Service Dealer |
| | Damage or dribbling nozzle | Contact to KOEL Service Dealer |
| | Control lever setting wrong | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Engine overloading | Ensure Load as per rating or manufacturer recommendation |
| | Worngly adjusted valve clearances | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Excessive end play in crankshaft | Contact to manufacturer or KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | Worn out valves and valves guides | Contact to KOEL Service Dealer |
| | Incorrect valves & fuel timing | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | Faulty governor setting | Contact to manufacturer or KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| Engine overheat | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Fresh Air intek and Hot air discharge not proper | |
| | Gap in radiator and Partition. Hot air recirculation inside canopy | Ensure proper sealing of radiator and Partition. |
| | Dirt/ clogged air cleaner | Clean air cleaner |
| | High exhaust back pressure | manufacturer recommendation,Contact to manufacturer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Wrong grade of lube oil used | Change the lube oil as per KOEL specification |
| | Dirt/choked suction tube strainer | Clean the tube strainer |
| | Clogged oil passage | Check and clear oil passage, Contact to KEOL service dealer |
| | Radiator fins choked | Clean the radiator fins |
| | Loose V-Belt | Contact to KOEL Service Dealer |
| | Air leakages through radiator & shroud | Block air passage and ensure no air recirculation |
| | No coolant or level low in radiator | Top up with K Cool super plus |
| | Engine overloading | Ensure Load as per rating or manufacturer recommendation |
| | Wrongly adjusted valve clearance | Contact to KOEL Service Dealer |
| | Prolonged oil change period | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Excessive end play in crankshaft | Contact to manufacturer or KOEL Service Dealer |
| | Engine seized | Contact to KOEL Service Dealer |
| Engine gives out blue smoke | Wrong grade of lube oil used | Change the lube oil as per KOEL specification |
| | Excessive oil in the sump | Check and rectify lube oil level upto High mark only |
| | Engine used after a long time | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | Worn out valves and valves guides | Contact to KOEL Service Dealer |

| | | |
|---|---|---|
| Engine give white smoke | Water mixed with fuel | Check the reason and sort out or Contact to manufacturer/ KOEL service dealer |
| Excessive fuel consumption | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Dirt/ clogged air cleaner | Clean air cleaner |
| | High exhaust back pressure | manufacturer recommendation,Contact to manufacturer |
| | Poor quality of fuel | Change the fuel and use good quality fuel |
| | External/internal fuel leakage | Check for any leakage and rectify |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Engine overloading | Ensure Load as per rating or manufacturer recommendation |
| | Blown cylinder head gasket | Contact to KOEL Service Dealer |
| | Valve leakages | Contact to KOEL Service Dealer |
| | Incorrect valve & fuel timing | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |
| Mixing of Diesel with lube oil | External/internal fuel leakage | Check for any leakage and rectify |
| | Damage or dribbling nozzle | Contact to KOEL Service Dealer |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | Incorrect valve & fuel timing | Contact to KOEL Service Dealer |
| | Injector needs adjustment | Contact to KOEL Service Dealer |
| | One or more cylinder not working | Contact to KOEL Service Dealer |
| Excessive oil consumption | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Dirt/clogged air cleaner | Clean air cleaner |
| | Wrong grade of lube oil used | Change the lube oil as per KOEL specification |
| | Excessive oil in the sump | Check and rectify lube oil level upto High mark only |
| | External/internal fuel leakage | Check for any leakage and rectify |
| | No coolant or level low in radiator | Top up with K Cool super plus |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| Low Lube oil pressure | Dust entry in air inlet system | Make necessary arrangement to stop dust entry without any modification in air inlet arrangement |
| | Loose wiring of sensor controller/ connection not proper | Tighten connect as per drawing |
| | Faulty Sensor | Replace sensor |
| | Dirt/clogged air cleaner | Clean air cleaner |
| | Wrong grade of lube oil used | Change the lube oil as per KOEL specification |
| | Dirt/choked suction tube strainer | Clean the tube strainer |
| | Lube oil dilution | Check and Change the lube oil as per KOEL specification |
| | Dirt/clogged lube oil filter | Contact to KOEL Service Dealer |
| | Clogged oil passage | Contact to KOEL Service Dealer |
| | Faulty oil pump | Contact to KOEL Service Dealer |
| | Engine overloading | Ensure Load as per rating or manufacturer recommendation |
| | Prolonged oil change period | Contact to KOEL Service Dealer |
| | Engine needs overhauling | Contact to KOEL Service Dealer |

| | | |
|---|---|---|
| Diesel knocking | Poor quality of fuel | Change the fuel and use good quality fuel |
| | Faulty fuel Pump | Contact to KOEL Service Dealer |
| | Incorret valve & fuel timing | Contact to KOEL Service Dealer |
| Mechanical Knock | Loose component | Check and ensure all component should be tighten. |
| | Component fouling with any other component | Check and ensure all component should fitted properly |
| | Worngly adjusted valve clearances | Contact to KOEL Service Dealer |
| | Broken/worn out piston rings | Contact to KOEL Service Dealer |
| | Excessive end play in crankshaft | Contact to manufacturer or KOEL Service Dealer |
| | Incorrect bearing clearances | Contact to KOEL Service Dealer |
| | Worn out cylinder liner & piston | Contact to KOEL Service Dealer |
| | Damaged main & connecting rod bearings | Contact to KOEL Service Dealer |
| | Loose mounting bolts | Contact to manufacturer or KOEL Service Dealer |
| | Loose flywheel/wrong adjustment | Contact to manufacturer or KOEL Service Dealer |
| Excessive Vibration | AVM pad broken or wrong fitment | Replace if AVM Pad broken. |
| | Gap between foundation and base frame i.e. foundation level is not proper | Ensure proper foundation. Level should be proper |
| | Fluctuation in load | Uniform load should be on Genset |
| | Faulty governor setting | Contact to manufacturer or KOEL Service Dealer |
| | Loose mounting bolts | Contact to manufacturer or KOEL Service Dealer |
| | Loose flywheel/wrong adjustment | Contact to manufacturer or KOEL Service Dealer |
| Engine rotates very slowly during starting | Engine seized | Contact to KOEL Service Dealer |
| Battery runs down frequently | Under rated battery | Contact to manufacturer or KOEL Service Dealer |
| | Canopy lampt remain in ON position | Check and ensure proper use of Canopy Lamp |
| | Faulty starter | Contact to KOEL Service Dealer |
| | Battery of wrong capacity | Contact to manufacturer or KOEL Service Dealer |
| | Loose or dislodged wiring | Check wiring,it should be as per drawing and Tightened |

## TROUBLE SHOOTING - ALTERNATOR

| Description | Causes | Remedies |
|---|---|---|
| No voltage from Alternator | Decfective voltmeter | Check voltmeter and replace |
| | Short circuit between phases | Check and ensure no short circuit between phases. |
| | Neutral earthing short with body earthing | Check and rectify |
| | Power cable faulty | Cehck and replace |
| | Excitation circuit open | Check for loose connection |
| | Incorrect excitation circuit connection | Check for proper connection |
| | Low residual voltage | Check for residual voltage. If residual voltage is less than 2.5V(L-N) field flashing required for few seconds. |
| | | Field fleshing procedure-<br>1. Disconnect regulator connections.<br>2. Connect 12/24V battery keeping F1 to positive and F2 to negative terminal of excitor stator. |
| | Grounded excitor field | Check and correct |
| | Rotating rectifier faulty | Check rotating diodes |
| | Fuse in AVR failed | Replace fuses |
| | AVR Defective | Replace AVR |
| Voltage developed but excitation current is high | Rotating diode faulty | Check rotating diodes and replace faulty diodes |
| | Prime mover | Adjust prime mover |
| | Prime mover speed is low | Adjust prime mover speed to rated speed |
| Low voltage build up | V-Trim pot incorrectly set | Adjust voltage by V-Trim pot in AVR |
| | Low prime mover speed | Adjust prime mover speed |
| Voltage-High | Loose or no connection to 'U' terminals of the AVR | Check and correct |
| | Incorrect voltage setting | Adjust voltage by V-Trim pot in AVR |
| | AVR Defective | Replace AVR |
| Voltage fluctutation | Speed fluctuation of the prime mover | Set the speed of the prime mover |
| | Incorrect setting of stability pot | Adjust stability pot in AVR |
| | Leading load power factor | Correct the power factor |
| | Load hunting,fluctuates rapidly | Check and reduce the nonlinear load |
| | High percentage of non-linear load | Rectification, Correct percentage of non linear load |



*Contd.*

| | | |
|---|---|---|
| Over loading of Generator | Over loading of generator | Check the load and correct. To be in line with name plate rating |
| | Blocking of ventilation passage | Check ventilation and clean passage if necessary |
| | Low speed on load | Adjust prime mover speed |
| | Low load power factor | Reduce the load |
| | Generator operating at very high voltage | Check voltage and adjust |
| | High percentage of non-linear load | Check and reduce the nonlinear load |
| Excessive vibration and noise | Poor alignment | Re-align properly |
| | Coupling and foundation bolts loose | Tighten the bolts |
| | Bearing defective | Replace bearing |
| Over heating of bearing | Incorrect assembly of bearing | Re-assemble correct |
| | Bearing damaged | Replace bearing |
| Generator does not share KW load proportionately | Prime mover speed droop improperly set | Set prime mover speed properly,Droop ( Governor) characteristic of engines. |
| Generator does not share KVAR load proportionately | Quadrature droop incorrect | Set quadrature droop correctly by QDC Pot in AVR |
| | QDC-CT Polarity reversed | Interchange CT secondary |
| | QDC-CT are not in W-phase | Check and rectify |

# TROUBLE SHOOTING GUIDE FOR MANUAL PANEL

Engine does not start by turning the starting key/push botton provided on panel.

- Check connection of battery.
- Check Control MCB . It should be in ON position.
- Check the battery voltage at terminal 1 and 2 inside panel. It should be 12/24 V. If not , check circuit or get the battery charged before making further attempts as battery may be weak.
- The Engine cranks but fails to run.

  - Check the fuel supply line.
  - Check connection of fuel pipe at fuel tank, it may open.
  - Air in fuel line
  - Faulty fuel pump .
  - Water mixed with fuel.
  - Load is disconnected.

# TROUBLE SHOOTING GUIDE FOR AMF PANEL

Engine does not start from the AMF panel in any mode.

- Check the DC supply control MCBs and 3 Phase mains supply. These should be in ON Position.
- Check the battery voltage at terminal 1 and 2 in the AMF Panel. It should be equal to 12V/24V. If not, get the battery charged before making further attempts as the battery is weak.
- Check all control wires at control terminals in AMF panel.
- Check battery terminals. They should be properly tightened and should not be corroded.
- Check LLOP connection , it should be properly connected on engine terminal.
- Check all wiring connection should be properly tighten and all should be in order as per drawing.
  - The battery connection may be loose or corroded. Check and correct the problem.
  - If the MAINS supply is available, set the battery charger to boost and wait till the battery voltage is 12/24V.
  - Refer KG controller manual for further trouble shooting related to KG controller

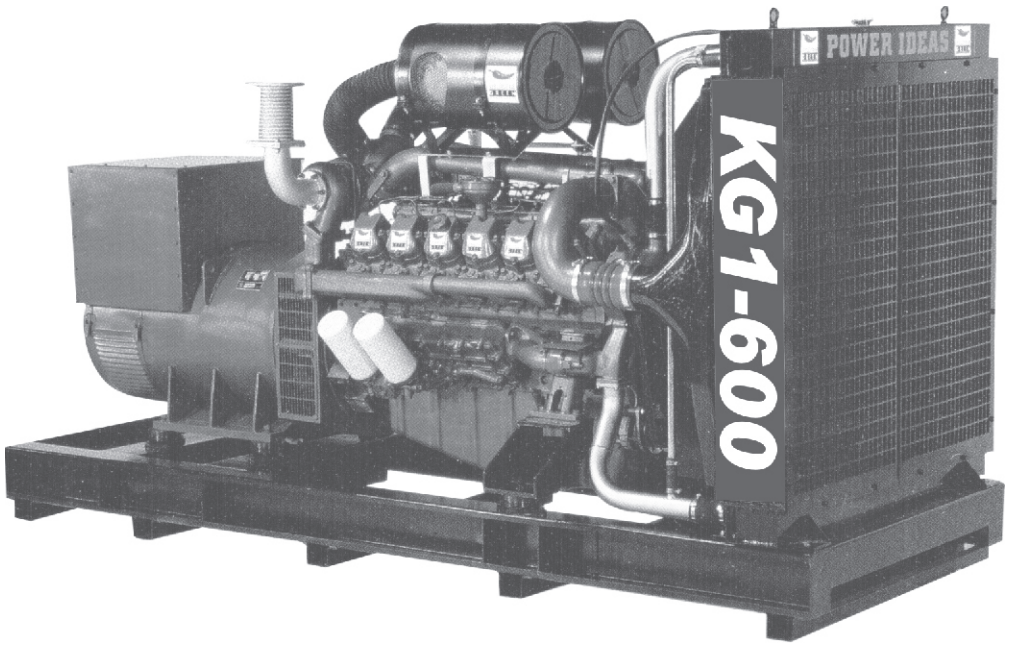
- Engine starts but there is no Voltage from the control Panel

  - Check HRC fuses/MCB below the DG/MAINS contactor. MCB should be in ON position and fuse should be OK.
  - Check the setting of AVM ( Alternator Voltage Monitor).
  - Check the overload relay , if it is tripped than press the reset lever.
  - Check power cable connection from Alternator to control panel.

- The Main supply is restored, but the load does not transfer.

  - Check the control MCBs these should be in 'ON' position.
  - Check if all three phases (RY, YB and BR) of Mains supply are available.

    All three phases should be available and voltage should be more that the setting of mains voltage monitor or AMF Relay/KG Controller
  - If required, lower the voltage setting of mains voltage monitor and differential setting or setting in AMF relays/KG Controller Increase the voltage setting gradually if Mains Voltage is not acceptable on load equipment.
  - Distance of panel from DG set should not be more than 5 meters.
  - Check wiring connection of MAINS contactor. Supply to contactor coil should be available.




**All Office Addresses, E-mail Addresses, Phone Nos. are on the Back Cover Page**

# JAKSON & COMPANY

## WARRANTY CERTIFICATE FOR SILENT GENSETS

This is to certify that Jakson & Company Diesel Gen Set Sr.No. .....is warranted to be free from inherent manufacturing defects under normal use and Preventive maintenance. The Silent GenSet will be repaired free of cost if it is go out of order due to ***inherent manufacturing defect*** of components as per schedule given below:-

- ***Engine/Alternator*** – warranty 2 years from the date of Invoice or 5000 Hours of operation, whichever is earlier.
- ***Acoustic Enclosure*** – 12 months from the date of invoice.
- ***Control Panel, Control Panel Parts & Battery*** – 12 months or 3600 hours of operation from the date of commissioning or 13 months from the date of invoice, whichever is earlier.
- ***Safety system, wiring harness, rubber components of engine, rubber sealing of canopy, hinges and lock:*** 12 months from the date of commissioning or 13 months from the date of invoice, whichever is earlier.
- The warranty is subject to condition that no alteration/addition or repair is done or attempted to be done. The warranty does not cover :-

❖ Normal Wear & Tear of the Components of Silent Gen Set.

❖ Any type of damages during handling or improper storage/installation & improper maintenance.

❖ If K Oil premium and K Cool Super Plus engine coolant is not used.

❖ **If first service check** has not been carried out through Authorized Service Dealer within **seven days of installation** , followed by second service check within **250 hrs or 3months** from the date of first service check, whichever is earlier.

- **This warranty will only be applicable if customer source the filters, K-oil premium, K-Cool super plus and avail the services from the Kirloskar Oil Engines Ltd Authorized Service Dealer.**

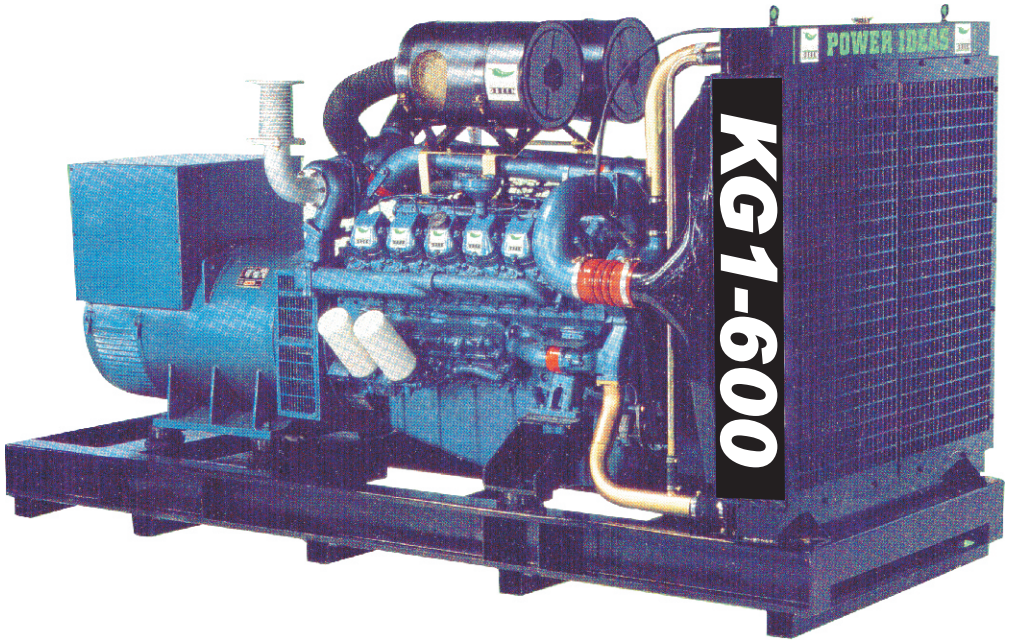
**This warranty is not a free service Contract.**

**Date: 08/14** For **JAKSON & COMPANY**

**Note- 1**. This warranty certificate is only applicable for supplies in India.

2. Warranty is applicable as per Kirloskar Oil Engines Ltd guidelines and Kirloskar warranty card can supersede this warranty certificate.
3. **Use Battery within one month from the date of Invoice** and follow all the guidelines for upkeepment of battery otherwise repairing/recharging/replacement under warranty will not be applicable. All charges pertaining to recharging of deep discharge battery will be to customer account.
4. ☞ **After commissioning of SDG set, responsibility of attending complaints under warranty and otherwise is of Authorized Kirloskar Area Service Dealer.**

## NOTE / REMARKS


POWER IDEAS
KG1-600